INITIAL STUDY/CHECKLIST AND NEGATIVE DECLARATION

Prepared for and by

North Coast Regional Water Quality Control Board

Willits Environmental Remediation Trust
Former Remco Hydraulics Facility
934 South Main Street
Willits, California
Mendocino County

In-Situ Hexavalent Chromium Soil and Groundwater Treatment

July 22, 2003
Revised August 26, 2003

North Coast Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

INITIAL STUDY/CHECKLIST AND NEGATIVE DECLARATION

This Initial Study/Checklist and Negative Declaration has been prepared in accordance with Title 14, Section 21080(c) of the Public Resources Code and Section 15070 and 15071 of the California Code of Regulations. The Negative Declaration is proposed for adoption at a meeting of the California Regional Water Quality Control Board, North Coast Region, on September 24, 2003.

Project Title: In-Situ Hexavalent Chromium Soil and Groundwater Treatment

Project Location/Address: Former Remco Hydraulics Site, 934 South Main Street, Willits, California, Mendocino County (See Figure 1)

Lead Agency: California Regional Water Quality Control Board, North Coast Region, 5550 Skylane Boulevard, Suite A, Santa Rosa, CA 95403

Decision Making Body: California Regional Water Quality Control Board, North Coast Region

Project Applicant: Willits Environmental Remediation Trust, 6016 Princeton Reach Way, Granite Bay, California 95746.

Project Description: The Willits Environmental Remediation Trust (WERT) is proposing to conduct interim remediation activities, specifically to treat soil and groundwater in-place (in-situ) that is contaminated with hexavalent chromium and volatile organic compounds (VOCs) using a pesticide-free food grade molasses. The area at the facility proposed to be treated is depicted on Figure 2. The project, called an interim remedial action (IRA), is detailed in documents titled: *Interim Remedial Action Work Plan for Hexavalent Chromium-Affected Groundwater* dated March 11, 2003; *Addendum to Interim Remedial Action Work Plan for Hexavalent Chromium Affected Groundwater* dated June 18, 2003, and August 20, 2003, which were then submitted for the Regional Water Board's consideration of Waste Discharge Requirements under applicant's Report of Waste Discharge (ROWD). In addition to providing details on the proposal, the workplans contain an evaluation of three alternatives: 1) the no action alternative, 2) standard groundwater pump and treat with a discharge of treated effluent to the sanitary sewer and/or surface waters, and 3) in-situ treatment to reduce hexavalent chromium to trivalent chromium. The workplans also contain an analysis of applicable regulatory standards, and details of the treatment process, such as: injection rates, pressures, depths of each injection point, chemical mixtures, soil stratigraphy, etc.

Environmental Finding: The staff of the Regional Water Board has determined, on the basis of the attached Initial Study/Checklist and the documents and sources referenced therein, that the project described above will not have a substantial adverse impact on the environment, provided that the mitigation measures identified in the project applicant's Report of Waste Discharge and the related Initial Study/Checklist are included in the project.

Initial Study/Checklist: The Initial Study/Checklist is attached**.** For more information call Janice Goebel at (707) 576-2676.

Mitigation Measures: The mitigation measures are included in the attached Initial Study/Checklist. The project applicant has agreed to implement all mitigation measures.

Introduction

This Negative Declaration and Initial Study/Checklist has been prepared so that the Regional Water Board can consider adoption of Waste Discharge Requirements for the proposed soil and groundwater treatment interim remedial action. The Regional Water Board proposes to consider adoption of Waste Discharge Requirements Order No. R1-2003-085 at a Regional Water Board meeting to be held on September 24, 2003. Order No. R1-2003-085 will allow the WERT to implement the interim remedial action. The interim remedial action is designed to treat soil and groundwater contaminated with hexavalent chromium and volatile organic compounds in the shallow groundwater (approximately 0-25 feet below ground surface) and groundwater at a depth of 25-40 feet below ground surface using a pesticide-free food grade molasses

This report is the Negative Declaration and Initial Study/Checklist required by the State CEQA Guidelines. It was prepared by Janice Goebel of the Regional Water Board. This study uses project information provided by the professional consultants for the Willits Environmental Remediation Trust (WERT).

Existing Facility

The site was a former machine shop and chrome plating facility. The former Remco Hydraulics site is approximately seven acres in size. The property has been vacant since 1995. A series of buildings exist at the site, which were constructed beginning in the 1940s and into the 1980s. The buildings comprise about 154,000 square feet of the property.

The machine shop operation required the use of metal cleaning solvents and other petroleum based products such as cutting oils. Spills, leaks, waste disposal activities and other discharges over the operational period of the facility resulted in VOC and petroleum hydrocarbon contamination of soil and groundwater.

Chrome plating operations required the use of high strength hexavalent chromium solutions, and solvents for degreasing purposes. Faulty design of tanks and chemical handling systems, coupled with spills, leaks, and unpermitted waste disposal activities over the operational period of the facility have resulted in hexavalent chromium and solvent contamination of soil and groundwater.

The Remco facility has a long history of improper handling and discharges of chemical solutions and waste materials. Regional Water Board files contain documentation of numerous instances when hazardous materials were improperly discharged to the soil surface (and thence to groundwater) as well as to surface waters. Regional Water Board enforcement actions at Remco date back to 1982 when hearings were conducted to refer violations of waste discharge requirements to the Office of the Attorney General. Since then, Cleanup and Abatement Orders have been issued, leading up to the current Cleanup and Abatement Order No. 99-55. The project applicant seeks to comply with this enforcement order, in part, with the proposed project.

Soil and groundwater is contaminated with hexavalent chromium, other heavy metals, volatile organic compounds, semivolatile organic compounds, and petroleum hydrocarbons. The property is fenced and the majority of the site is paved. Stormwater runoff from the site drains to the north side of the property and is collected in a storm drain system. The storm drain system flows to the east of the site underneath Highway 101 and discharges to Baechtel Creek. Baechtel Creek is a tributary to the Eel River.

Need for the Project

The proposed project would enable the WERT to proceed with interim actions to commence cleanup of groundwater contaminated with hexavalent chromium and VOCs prior to the selection and implementation of a final remedy for the site. Hexavalent chromium concentrations in groundwater have been measured as high as 400 mg/l (parts per million). The Maximum Contaminant Level, set by the State Department of Health Services, for hexavalent chromium is 50 parts per billion or 0.05 parts per million. The proposed project would significantly reduce the toxicity and mobility of hexavalent chromium in groundwater. Without effective cleanup measures, the migration of contamination in groundwater is largely uncontrolled.

Specific objectives of the project are to: 1) reduce hexavalent chromium to a less toxic and less mobile trivalent form of chromium in soil and groundwater, 2) protect human health and the environment, 3) limit the migration of hexavalent chromium in soil and groundwater, 4) restore water quality in the area of the former chrome plating tanks and the areas where soil and groundwater contamination has migrated, and 5) reduce the time for site cleanup.

Setting

The Remco Facility is an elongated, fenced parcel of approximately seven acres, located immediately adjacent to and west of U.S. Highway 101 (Main Street) in the southern portion of the City of Willits, California. The facility is bounded on the south by California Western Railroad tracks and a small seasonal drainage ditch running further south of and parallel to the tracks. To the south of the drainage ditch is Walnut Street, residential property, and the Baechtel Grove Middle School. Located west of the facility are a horse pasture and corrals, commercial properties and residential properties. Residences and now an empty lot recently purchased by the WERT are located to the north of the facility. The residences to the north of the site are within 10 feet of the facility building, and approximately 50 feet from the project area. To the east of the facility, across Highway 101, is a Safeway shopping center and Baechtel Creek. Baechtel Creek generally flows from the south to the north in the vicinity of the facility. Baechtel Creek is a tributary to Outlet Creek and the Eel River.

Currently, a concrete-floored metal building of approximately 154,000 square feet occupies more than half of the Remco facility. On the western portion of the facility, a smaller building exists that was formerly utilized for storage of raw and spent hazardous materials utilized in the manufacturing processes at the facility.

The facility has an asphalt-paved, fairly flat surface that slopes generally northeastward. The horizontal distance from the southwest corner to the northeast corner is about 1,150 feet. The southwest corner of the property is ten feet higher in elevation than the northeast corner of the property. Currently, surface water drains to six catch basins on the northern side of the building and one catch basin on the south side of the building. Stormwater is conveyed through an underground storm drain system which runs along the northern facility boundary. The storm drain system extends eastward beneath Highway 101 and the Safeway parking lot, and eventually empties into Baechtel Creek.

The subsurface stratigraphy at the site consists of alluvial deposits of gravel, sand, silt and clay. Available data suggest that the coarser-grained material was deposited in stream channels while the finer-grained material was probably deposited in relatively slow moving water in the area between the stream channels or as lake deposits. Three water-bearing zones have previously been identified at the site, and are referred to, from shallowest to deepest, as the A-, B-, and C-zones. Although the water bearing zones are generally fine-grained deposits, they tend to contain more coarse-grained deposits than surrounding strata. The identified coarse-grained deposits do not generally form a continuous layer laterally over the entire area investigated; however, in some cases the lenses are observed/interpreted to locally interconnect and exhibit varying degrees of hydraulic communication with each other.

Groundwater is encountered at relatively shallow depths typically ranging from three to eight feet below the ground surface at the site. In the winter and spring months, groundwater has risen to the ground surface. Monitoring wells completed into the saturated zone have exhibited flowing artesian conditions. As described above, three water-bearing zones (A-, B-, and C-zones) have been identified at the site. The A-zone is approximately 15-25 feet below ground surface (bgs), the B-zone from about 20-40 feet bgs, and the C-zone from about 35-60 feet bgs. In the A-zone, the hydraulic groundwater gradient is to the northeast at approximately 0.009 to 0.020 feet/foot. In the B-zone, the hydraulic groundwater gradient is to the northeast at approximately 0.016 to 0.019 feet/foot. Within the C-zone, the hydraulic groundwater gradient is to the northeast, but more to the east than the A- and B-zones, at approximately 0.034 to 0.038 feet/foot.

Project Description

The efficacy of the proposed project was demonstrated in a pilot study conducted in 2000/2001 (*Final Post-Injection Report on Pilot Study of In-Situ Chromium Reduction, Former Remco Hydraulics, Inc., Facility, Willits, California*). The pilot study involved injection of molasses to groundwater in one area, and calcium polysulfide to groundwater in another area, in accordance with Waste Discharge Requirements Order No. R1-2000-54. The studies were performed to evaluate the effectiveness of reducing concentrations of hexavalent chromium as well as to monitor any unwanted effects from the release of the compounds in the subsurface. The results of the study showed dramatic reductions in hexavalent chromium levels (in general, to laboratory detection limits) for the molasses while the calcium polysulfide treatment was not

nearly as effective. No significant adverse environmental effects were found to result from that effort based on air and water monitoring and related reporting requirements.

The proposed project consists of an interim remedial action designed to reduce hexavalent chromium to trivalent chromium in-situ, using a solution of pesticide-free food grade molasses. Volatile organic compounds also exist in the proposed treatment area. Trivalent chromium is much less toxic than hexavalent chromium and is less mobile in soil and groundwater. The WERT is proposing to inject a dilute solution of molasses into shallow groundwater.

There are 50 proposed injection points in the A-zone at 15 to 20 feet below ground surface. In addition, there are 6 more proposed injections points into the B-zone at 20 to 40 feet below ground surface. No injections are proposed for the C-zone. Four locations are planned beneath the concrete floor. Additional injections of molasses may be necessary to complete the reduction of hexavalent chromium to trivalent chromium.

A 10 % solution of molasses will be used for the more permeable soil strata (sands and gravel); and a 20% solution will be used for less permeable soils (silts and clays). The proposed treatment area is depicted on Figure 2.

The treatment process for hexavalent chromium in groundwater is to inject a carbohydrate solution into the subsurface as a food source for microorganisms present in soil and groundwater. The readily degradable carbohydrates, once in the subsurface, are consumed by microorganisms in the aquifer. As the microorganisms degrade the carbohydrates, the available dissolved oxygen in the groundwater is depleted, producing a reducing environment. Under the reducing conditions, a number of biotic and abiotic processes can occur that reduce hexavalent chromium to trivalent chromium. As an example, hexavalent chromium can serve as a terminal electron acceptor for the metabolism of carbohydrates by species such as *Bacillus subtilis*. Hexavalent chromium can also be reduced to trivalent chromium during an extra-cellular reaction with by-products of sulfate reduction such as hydrogen sulfide. Abiotic oxidation of soil organic matter, such as humic and fulvic acids, also can reduce hexavalent chromium to trivalent chromium.

The primary end product of the reduction reaction is chromium hydroxide which readily precipitates out of solution under alkaline to moderately acidic conditions such as those found at the site. The chromium hydroxide precipitate is an insoluble, stable precipitate, immobilized in the soil matrix of an aquifer. In addition, the oxidation of trivalent chromium to hexavalent chromium in a natural aquifer system is unlikely. The proposed treatment area and the proposed injection points are shown on Figure 3.

For chlorinated volatile organic compounds, the reducing environment created by the carbohydrate injection will promote and enhance the dechlorination of VOCs. The VOC treatment process is to provide a food source for the existing microorganisms in the aquifer. The microorganisms consume the food substances and donate electrons in the course of their metabolism. Once the electron acceptors are depleted, the microorganisms use the chlorinated VOCs as electron acceptors. Sufficient food source is needed over a period of time to complete the dechlorination of chlorinated VOCs to benign breakdown products like carbon dioxide and water. Therefore, more than one injection may be necessary to provide a sufficient food source to complete the dechlorination process.

The WERT has indicated that the proposed interim remedial action may temporarily mobilize iron, manganese, arsenic, and/or antimony. In addition, the interim remedial action may create a temporary increase in the concentration of vinyl chloride in the injection area as part of this interim remedial action. Breakdown products from treatment of VOCs were observed in the 2000 Pilot Study. This will require employment of a contingency plan to prevent off-site migration of compounds deleterious to water quality. The contingency plan will be included in the Waste Discharge Requirements. In addition, the process has the potential to generate hydrogen sulfide gas. If an upward trend in the concentrations of metals or vinyl chloride occurs, a contingency plan to add an oxygen source to groundwater will be implemented. The contingency area is located at the downgradient edge of the plume. The contingency area monitoring wells will be used to determine if metals or VOC byproducts is mobilized. The contingency plan will be activated to shut down the chemical reactions and arrest further migration of these constituents. The contingency plan consists of injecting a dilute solution of hydrogen peroxide upgradient and downgradient of the injection area to prevent migration of metals and VOCs beyond the boundary of the property owned by the discharger.

Groundwater monitoring proposed in the IRA will be accomplished by sampling 23 groundwater-monitoring wells in the A-zone, 8 wells in the B-zone, and 5 wells in the C-zone. No treatment is currently proposed for the C-zone; however, monitoring will determine any impacts to groundwater quality in this area. The groundwater monitoring well locations are depicted on Figure 3. Groundwater monitoring over time will be used to evaluate existing groundwater conditions. A comprehensive Monitoring and Reporting Program (No. R1-2003-085) will be considered for adoption as part of the Waste Discharge Requirements at the September 24, 2003 Regional Water Board meeting.

The Monitoring and Reporting Program requires sampling groundwater monitoring wells for total chromium, hexavalent chromium, volatile organic compounds (about 68 different compounds), petroleum hydrocarbons, 1,4-dioxane, dissolved iron, manganese, arsenic and antimony, bromide and chloride, alkalinity, nitrates, sulfates, total organic carbon, chemical oxygen demand, oxygen reduction potential, dissolved organic carbon, redox potential, pH, dissolved oxygen, temperature, and conductivity. The air sampling program requires the use of a Jerome Meter to monitor for hydrogen sulfide, and a photoionization detector and Color tubes® to monitoring for volatile organic compounds. The air monitoring stations are located within the project area, and on the perimeter of the site. There are approximately 14 proposed mobile air monitoring stations.

Issues Raised By the Public or Agencies

Members of the public have raised the issue of the generation of hydrogen sulfide gas and the generation of vinyl chloride. No hydrogen sulfide was detected in ambient air at unsafe levels. However, an air monitoring program will be conducted. The air monitoring program requires air sampling prior to injecting molasses, during the injection process, and following the injection process. The air monitoring program is specified in Draft Monitoring and Reporting Program No. R1-2003-085.

The project proponent has indicated that metals may be mobilized as part of this process. Groundwater monitoring as part of a pilot study where molasses was injected revealed the mobilization of metals to groundwater. However, the mobilization of metals (iron, manganese, arsenic, antimony) in groundwater was localized to the study area and did not migrate outside of the project area. A groundwater monitoring program is included in the Draft Waste Discharge Requirements to evaluate the mobilization of metals as part of this project. The groundwater monitoring program is specified in Monitoring and Reporting Program No. R1-2003-085.

Permits Required

The following is a summary of the permits/requirements that may be needed for the project:

The WERT must comply with regulatory and permitting requirements including California State Water Resources Control Board Resolutions 92-49 and 68-16; Title 27, Division 2, California Code of Regulations; and any local, state and federal permitting requirements.

A Waste Discharge Requirements Order will be required to proceed with the project. The draft Waste Discharge Requirements Order No. R1-2003-085 will be considered for adoption at a Regional Water Board meeting to be held on September 24, 2003. In addition, a Monitoring and Reporting Program, included as part of the Waste Discharge Requirements, will also be required to proceed with the project.

A permit (State Portable Equipment Permit) for the drilling rig may be needed if: 1) the drilling rig has a portable diesel engine over 50 h.p., and 2) the diesel engine is not the same engine that drives the truck.

Initial Study/Checklist

The attached checklist is taken from Appendix G of the State CEQA Guidelines. For each item, one of four responses is given:

> No Impact: The project will not have the impact described.
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> Less Than Significant Impact: The project will have the impact described, but the impact will not be significant. Mitigation is not required, although the project applicant may choose to include mitigation measures to reduce the impacts.
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> Potentially Significant Unless Mitigated: The project will have the impact described, and the impact will be significant. One or more mitigation measures have been identified that will reduce the impact to a less than significant level.
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> Potentially Significant Impact: The project may have the impact described, and the impact is significant. The impact cannot be reduced to a less than significant level by incorporating mitigation measures. An environmental impact report must be prepared for this project.

Each question on the checklist was answered by evaluating the project as proposed in the Report of Waste Discharge, that is, without considering the effect of any added mitigation measures. As proposed in the Report of Waste Discharge, and as reflected in the proposed Waste Discharge

Requirements, the project includes various constraints and conditions which reduce all potentially significant impacts to a level that is less than significant. The checklist includes a discussion of the impacts and mitigation measures that have been identified. Sources used in this Initial Study/Checklist are numbered and listed beginning on Page 37 of the Initial Study/Checklist. The WERT has agreed to accept all mitigation measures listed on this checklist as conditions of approval of the proposed and has agreed to obtain all necessary permits.